#10

Archaeology File

A PRELIMINARY REPORT
ON THE
EARLY HISTORY AND ARCHAEOLOGY
OF
KAHAUALE'A, PUNA, HAWAII

BY

TOMMY HOLMES

PREPARED FOR

THE ESTATE OF JAMES CAMPBELL

APRIL 14, 1982

DISCLAIMER

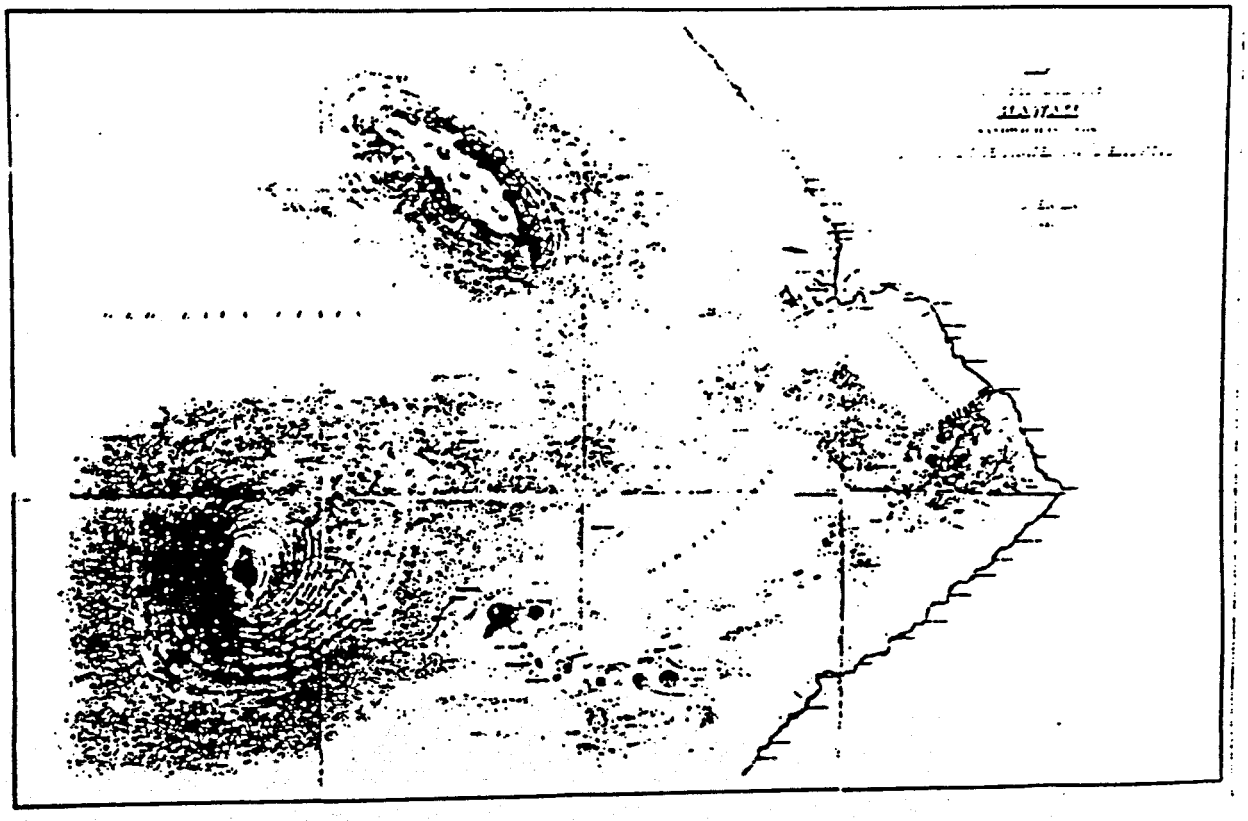

TABLE OF CONTENTS

ATTACHMENTS:

1) Project Location Map.

2) Wilkes' Map of the Southeastern Portion of the Island of Hawaii 1844.

3) Lydgate Survey Map 1875.

4) U.S. Geological Survey Maps: Puna (with suspected site areas marked), Puna Forest, Glenwood and Wahaula Quads 1912/1922.

5) Hudson Site Map 1932.

6) Bryan Vegetative Cover Map 1957.

7) TMK Kahauale'a, Puna, Hawaii Map.

8) Site Development Plan Kahauale'a Geothermal Project.

PREFACE

The following is a report on the findings of a documentary literature search on the ahupuaa of Kahauale'a in the Puna District of the island of Hawaii. Attention is given to the entirety of the ahupuaa, though the emphasis is on the mauka portions from about 1,500' to 3,800' elevation, or roughly three miles inland to the northern terminus of the ahupuaa, just below Kilauea Iki. The report was commissioned by The Estate of James Campbell for purposes of ascertaining what the extent of early Hawaiian activities and/or habitation occurred in the mauka regions of Kahauale'a—specifically to see if proposed geothermal drilling activities in these areas would disturb any archaeological sites.

GENERAL BACKGROUND

Kahauale'a (Lit. the hau tree or dew of Le'a) is one of the larger ahupuaa in the Puna District of the island of Hawaii. The District of Puna was originally one of the six chiefdoms or moku of the island of Hawaii. Not a district that produced any great and powerful chiefs or families, it more often found its course tied up with that of the neighboring Districts of Ka'u and Hilo.

Anthropologist E.S.C. Handy noted that "One of the most interesting things about Puna is that Hawaiians believe, and their traditions imply, that this was once Hawaii's richest agricultural region and that it is only in relatively recent time that volcanic eruption has destroyed much of its best land." [Handy 1972: 542] Captain Ed Dutton records in his travels through Puna in the early 1880's that "the traditions of the natives declare that no King ever reigned in Puna without seeing large parts of his dominion overflowed." [Dutton 1884: 150] While probably an exaggeration, the statement nevertheless illustrates the fact that the Puna District's allegedly fertile lands were as much threatened and scourged in pre- as in post-contact times. Kahauale'a in particular is known to have had large areas covered by both recent (1922, 1963 and 1968) and older flows. Botanist S. M. Seigel [1981: 59] has stated "Nothing on the [proposed geothermal] site can exceed the age of the oldest volcanic surface, namely 500 years". His method of arriving at this figure is unknown.

The existing vegetation cover of Kahauale'a ranges from the densest of ohia rain forest covering much of the mauka lands to a less dense mixed tree and fern forest to more open forest and secondary pasture land, with a scattering of both native and introduced grasses and trees. Little of Kahauale'a apparently lent itself to intensive agriculture as did other Puna ahupuaa, though it will be seen that there was agricultural activity in Kahauale'a both close to the shore and well inland.

POPULATION DYNAMICS OF THE SOUTHWESTERN PORTION OF PUNA

Early missionary Ellis, traveling through Puna in 1823, furnished the first known accounts of the population of Puna. He noted at Kealakomo, a desolate coastal fishing village a few miles west of Kahauale'a, that "the village is populous";

some 300 people assembling on one occasion "to hear the word" [Ellis 1825: 150,152]. Of the Panau to Kahauale'a area he says "the habitations of the natives were more thickly scattered over the coast" [Ellis 1825: 154]. By comparison he called Kalapana, just east of Kahauale'a "a small village on the sea-shore" [Ellis 1825: 154].

To estimate the population of Kahauale'a during pre- and early post-contact times is all but impossible. It can though be reasonably assumed that because of the nature of the terrain, climate and vegetation of Kahauale'a's interior, nearly all its inhabitants lived on or quite near the sea. One of the best of the few canoe landings along the Puna coast was located at Kahauale'a, making it an important fishing village. The nearshore presence of potable water at Queen's Bath, Punaluu pool and other small pools coupled with a number of sites and at least two heiaus - Punaluu and Waiaka - and possibly another [Hudson 1932: 429] located near the shore would suggest that the coastal area in and about Kahauale'a made for desirable habitation.

Chester Lyman, visiting southwestern Puna 23 years later in 1846, indicates a quite rapid depopulation noting, "The little naked village of Kealakomo [was] the first human habitation we saw after leaving Komomoa [Kamoamoa]... There are but few people in this region...miserably poor and for some time past have been almost in a state of famine" [Lyman 1924: 103]. Two epidemics in rapid succession (1848 and 1849) further decreased the population of Puna. "From this time [1848-9] on the depopulation of Puna was hastened by natural attrition among the weakened people" [Barrera and Barrere 1971: 7] Early archaeologist A. E. Hudson notes during his survey of the Kahauale'a and nearby areas in 1931-2 that "At the present time there is no permanent human habitation along the coast from Kupaahu [Kapaahu an ahupuaa immediately to the east of Kahauale'a], in Puna, to Punaluu in Kau, a distance of about 40 miles [Hudson 1932: 484].

KAHAUALE'A FOLKLORE

Giving Kahauale'a a bit of distinction are two rather interesting traditions--one about lovers, the other about coconuts. According to Fornander, "Apua and his brother went to Kahiki [islands to the south] and brought the coconut here to Hawaii, because they were sons of Kahiki who came to Hawaii... The coconut was planted there at Kahauale'a and Kalapana; that is where the first coconuts were first planted, and after that they were taken and planted in other parts of Hawaii nei" [Fornander 1916-1920: 592,3]. It is to be noted that coconuts were almost surely not found in Hawaii prior to the arrival of the first Hawaiians. This

stands in contrast to many other Pacific islands where coconuts often greeted first-time visitors. To this day, residents of Kalapana/Kahauale'a speak of traditions associated with planting coconut trees.

A more romantic tradition speaks of "the Kahauale'a stream... it is a subterranean stream on the seaward side of Kalapana, close to the sea... The Kahauale'a stream runs in the sea. If you have a sweetheart at Molokai or Maui, you can write a message, toss it into this supernatural stream, and it will reach its destination. The water of the stream will carry it to the one you love." [Kane 1929] While the Hawaiians, of course, had no written language, the tradition is most probably an old one modified to reflect more modern and reliable communication modes.

BIRD-CATCHING

The pre- and early post-contact native forest regime of mauka Kahauale'a, with its extensive ohia canopy provided a near ideal habitat for many of the birds sought after by bird-catchers, kia manu. Feathers from certain birds were made into the highly-prized feather work artifacts of the ali'i - capes, cloaks, helmets, kahili, etc.

Surveyor, R. A. Lyman testifying on the boundary settlement petition of Kahauale'a for James Campbell in 1893, furnished native testimony he collected in 1873: "Kalakolohe was the kamaaina, a bird catcher...for Kahauale'a" [Petition Kahauale'a Boundaries 1893, State Archives].

Early Hawaiian scholar, N. B. Emerson writing in 1895 about bird-catching considered Kilauea, Puna, and upper Hilo amongst the most desirable bird-catching areas in the islands, implying that Kahauale'a by its location (in Puna and contiguous with Kilauea) and type of vegetative, cover was ideal bird country. British ornithologist Scott B. Wilson who spent ten days with a bird-catcher, Hawelu, in Ola'a in 1887 remarked that "Ola'a in the district of Puna [was] a place renowned in ancient times for its bird-catchers" [Manning 1981: 60]. Ola'a is proximate to mauka Kahauale'a and its environment quite similar. That two of the very few general references to bird-catching mention the general vicinity of Kahauale'a as being amongst the best procurement areas, suggests that Kahauale'a mauka at one time provided an important source of valuable bird feathers.

N. B. Emerson notes of a typical traditional bird-catcher that he made "his home for long periods in the wooded solitudes of the interior... Having selected camp he erects the

necessary huts for himself and family. His wife who will keep him company in the wilderness will not lack for occupation. It will be hers to engage in the manufacture of kapa...and perhaps to aid in plucking and sorting the feathers" [Emerson 1895: 102, 105, 106]. Any vestiges of such encampments would probably be long gone, though probable associative plantings of certain basic cultigens could conceivably still be in evidence.

TRAILS

In Puna, where canoe landing and launching sites were very few and extremely dangerous, trails held special significance. Given terrain that was alternately rugged lava and thick jungle, Puna residents had no choice but to develop a good trail system over which a great part of trade, communications and transportation occurred.

Several old trails were known to have either passed through Kahauale'a ahupuaa or started at some point outside the area or at the coast and penetrated into Kahauale'a for a certain distance. At least four of these trails traversed Kahauale'a in a rough east-west direction. The trail most makai followed the contour of the coastline just a few feet from the ocean. This ancient trail, portions of which remain today, was in common use by fishermen and travelers. It continued except where prohibitive around much of the entire coast of the island.

A second ancient trail called on maps today the Kalapana or Volcano-Kalapana Trail crossed Kahauale'a a little more than half a mile inland. This was apparently the preferred route in traveling from Puna to the Volcano area (although there were other routes, e.g. Ellis' path). Captain C. E. Dutton traveling this route in 1884 noted that "the road leads through a forest of ohia, with a heavy undergrowth of large ferns and shrubbery, and over fields of pahoehoe only partially covered with a scanty soil." He notes further of the trail that "[a] few miles further on we are clear of the ohia forest and find ourselves among the beautiful kukui..." [Dutton 1884: 146, 147] The significant point here is that this trail went through several miles, apparently, of the densest type of ohia forest, not in any way different from that found in Kahauale'a. In fact this trail, if it did not penetrate Kahauale'a at any point, passed very close by.

Coming up on this same trail from Puna, one could continue on to the Volcano or branch off to the right just below Makaopuhi crater to re-enter and recross Kahauale'a at about

the 2,700-ft. level. About ten miles inland, this ancient trail, called the Glenwood-Makaopuhi Trail on today's maps, took one through to Keeau and Ola'a and eventually back to Hilo.

The fourth ancient trail, used by Capt. Wilkes' party in 1840, apparently began just to the east of Makaopuhi and traversed Kahauale'a at about the 2,200-ft elevation, passed just north of Kalalua crater and continued down the rift zone [Wilkes 1845: map of the Southeast portion of Hawaii]. That there was a trail in this vicinity is all but indisputable. Wilkes clearly refers to a "direct path" [Wilkes 1845: 181, 182] and in fact on his map shows two trails roughly paralleling each other leading from the Makaopuhi area to and beyond Kalalua crater. Kaipo Roberts [personal communication February 1982], long-time resident at Kahauale'a, remembers hearing of this trail being actively used into the early 1900's. Biologist Jim Jacobi, in a bird survey of this area in the late 1970's, reports [personal communication March 1982] that remnants of this old trail can still be seen in the Kalalua crater area. Wilkes' map indicates a convergence of still more trails just to the east of Kalalua Crater though this is probably an error. The actual convergence of trails is most likely that seen on modern maps a few miles down the rift zone from Kalalua towards Kapoho.

Both of the trails described as traversing the mauka portion of Kahauale'a, not unexpectedly, cross the ahupuaa in the midst of a relatively narrow strip of land with, to quote naturalist E. H. Bryan, "scattered mixed tree species. Thin soil over pahoehoe. Some grass." [Bryan 1957: vegetation cover map done for Campbell Estate] Land on either side of these strips is very densely covered with vegetation.

Hudson also mentions an "old trail across the lava flow south of Makaoiki [a heiau in Kahauale'a about a mile inland]. Smooth, flat water-worn beach boulders have been placed about two feet apart for a quarter of a smile across the rough aa flow." [Hudson 1932: 435] It is assumed this trail ran east-west, though it is not clear.

Makai-mauka trails are shown on U.S. Geological Survey maps compiled in 1912 and 1922. A single trail begins at the coast on the border of Kahauale'a and Kapaahu ahupuaa and runs inland for about three miles in a roughly northerly direction before it branches. The major branch, called the Kapaahu trail, continues into Kahauale'a till about the 1,500-ft. elevation where on the map it terminates. The branch trail fairly closely parallels the Kapaahu trail before it too seems to end at about the same elevation. Most likely one or both trails might have at one time gone

considerably further inland serving bird-catchers, canoe-makers, upland farmers, forest product gatherers, travelers, etc. At the time of the survey, mauka portions of this trail might well have become overgrown and/or obliterated by lava flows. Chester Lyman reported in 1846, taking a trail that appears to have started at the coastal village of Kahauale'a and continued almost due north into the interior of Kahauale'a and back to Hilo.

> "Our route from Kahauale'a [village] lay northerly, gradually rising. By half-past 2 p.m. we had reached a plantation in an unsettled region. ...we went on about 5 miles further, or 10 miles from Kahauale'a [village] over an exceedingly rough and jagged path and through a dense, miry thicket to a small grass shanty... In the midst of the dense woods we had just passed, and about 9 miles from Kahauale'a [village] we crossed two chasms...formed by the eruption of 1840" [Lyman 1846: 19].

While Lyman's course directions are rough, they would strongly suggest a fairly well kept trail running almost due north through Kahauale'a ahupuaa possibly joining with the so-called "Glenwood-Makaopuhi" trail, since Lyman and his party were on their way back to Hilo. Lyman's reference, plus those on maps, would indicate that there was at least one, and probably several, well-defined trails into the farthest reaches of Kahauale'a mauka.

In addition, Hudson, who did an archaeological reconnaissance of the Puna area in 1932, reports near the furthest mauka reaches of Pulama ahupuaa, which is contiguous with Kahauale'a to the west and north, an "old trail leading inland past the west end of [a] terrace... The trail is now much overgrown but it is possible to follow its line by the footworn stones which in steep places serve as steps." [Hudson 1932: 463] The trail as Hudson describes it begins almost three miles inland (it undoubtedly continued on the other direction to the shore) and would have in a matter of a few hundred yards entered Kahauale'a at about 1200'-1500' elevation.

Indeed there were probably a number of coast-inland trails that accessed the archaeological sites, reported as far as three miles or more inland on neighboring ahupuaa of Kahauale'a. That some would have gone inland up the Kahauale'a corridor is not at all unlikely.

Beginning in the early 1800's trails were often modified and improved to allow for horse travel and/or horse-drawn carts. The first account of a horse and rider using a trail through Kahauale'a, in this case probably the Kalapana-Volcano Trail, was by Nordhoff in 1874.

The manufacture and export of pulu, the soft, wooly substance found at the base of hapuu ferns, was, according to Thrum, an important industry from 1851 to 1884. Most pulu came from an extensive tract of fern and ohia forest in the Kilauea vicinity leased by Kaina, a district judge, called by Brigham a "remarkable Hawaiian". An early ethnologist Brigham, who visited the area in the late 1800's, noted that, "In the early sixties [1860's] the business of picking and packing pulu had become so important that trails cut by the many natives thus employed opened the crater country far more than ever before." At one point Brigham notes turning "into a path cut through the jungle and, as the soil was a soft black mold, it had been paved with the stems of the tree-ferns about six inches in diameter. This 'corduroy' road was constructed with great labor by the natives, and we calculated that forty thousand pieces of fern were used to build it..." [Brigham 1906: 94] Judging from Brigham's and others descriptions a number of these trails wended their way through Kahauale'a's fern forests. While some undoubtedly followed ancient routes, many trails were known to have been constructed expressly for accessing pulu.

Captain C. E. Dutton exploring in 1884 the "vicinity of Kilauea" speaks of the Napau-Makaopuhi rift zone area as a "region which is densely forest-clad, and which the traveler crosses only by means of trails hewn through the woods" [Dutton 1884: 125]. To follow his narrative he is referring, amongst other places, to upland portions of Kahauale'a. These trails were probably both long-established routes and relatively recent paths made by pulu gatherers.

An interesting aside to traveling through mauka Kahauale'a and adjacent lands is a sobering reference to the fact that "holes are common in this part of Puna [Kahauale'a mauka], and natives occasionally disappear mysteriously." (Brigham 1909: 97] Shigeru Shimizu who used to pig hunt in the upper portions of Kahauale'a reported [personal communication March 1982] that he and his friends no longer hunt in Kahauale'a mauka because they have lost too many dogs down unseen cracks and fissures. Other contemporary informants have echoed these observations noting that Kahauale'a mauka is among the most dangerous if not the most dangerous area known to walk through on the island of Hawaii.

SITES

The accounts of Ellis and other early writers indicate that the majority of the prehistoric occupants of Kahauale'a ahupuaa and neighboring ahupuaa lived within a kilometer (0.6 mile) of shore. Adjacent waters were, though rough,

quite rich, and undoubtedly kept a number of residents continually occupied with fishing and other marine food gathering activities. According to Edmund Ladd, National Parks Archaeologist, there was also apparently active utilization of the land at and adjacent to Kahauale'a for an average of three kilometers (c. 1.9 miles) inland. Ladd [personal communication 1982] reports that his investigations within this band reveal sometimes numerous agricultural sites accompanied by what appear to be temporary habitation sites. Ladd avers that the seeming absence of sites beyond three kilometers inland would appear to be a function of increased rainfall, greater walking distance from the shore and poor soil conditions. He does qualify his statement though, by saying no one to his knowledge has done an archaeological reconnaissance any further in than three kilometers. In fact it will be seen that, if various accounts by travelers and explorers through the Kahauale'a area are to be believed, there were quite likely ancient and 19th century sites located in the interior portions of Kahauale'a.

As mentioned previously, most known sites in Kahauale'a are found quite close to the shore. The most seaward is a canoe ladder site, one of several along the cliff-bound coast of Puna. The interesting feature about this particular canoe ladder, located in front of Kaipo Roberts kuleana, is that it was used right up till the beginning of WWII by several local Hawaiian resident fishermen. These canoe ladders, constructed of ohia and/or kauila wood, were ingenious contrivances for entering and leaving the ocean with a canoe along a predominantly beachless coastline. [See Holmes 1981: 100-102]

Considering the numerous ahupuaa that make up the Puna District, the reported presence of three heiaus in Kahauale'a alone, where many other Puna ahupuaa, often more populous, had none is of some interest. Furthermore, the proximity of Wahaula heiau, one of the most important heiau in the islands and according to Hawaiian scholar T. G. Thrum "the last of the temples to give up its heathen worship upon the overthrow of idolatry in 1819" [Thrum 1908: 38], suggests that the Kahauale'a region was not unimportant.

Located within a couple of hundred yards from the sea adjoining Waikupanaha pond is what Hudson [p. 428] calls Waiaka heiau. Hudson and Thrum both report Waiaka heiau in Kahauale'a though an early map (1922), where it is called Waike heiau, shows it in neighboring Kapaahu. Of unknown class its remains are reportedly quite disturbed. Hudson reports a number of other undetermined sites in this area and notes that a local informant said that Waiaka heiau and

nearby features "belong to two heiaus built side by side but he is uncertain where the division lay between them" [Hudson 1932: 429]. He also reports in the area a cave called Luamakini adjoining a terraced mound.

Hudson goes on to report that between Punaluu heiau located "a quarter of a mile west of Kupaahu village and about 100 yards seaward of the Volcano-Kalapana trail" [Hudson 1932: 431] and Waiaka heiau "are many walls... Some of these are comparatively recent but others appear to be very old." [Hudson 1932: 430] Punaluu heiau, unquestionably in Kahauale'a, was quite large and complex and is figured in some detail in both Hudson [1932: 431,2,3] and a site plan with notes done by Kekuhuna in 1951 and appended to an earlier report submitted to Campbell Estate.

The other reported heiau in Kahauale'a, called by Thrum and Hudson, Makaoiki, was located "about a mile inland from Kupaahu village...in the middle of an aa flow. Some paving of small aa pebbles still remains but not enough to indicate the extent or plan of the heiau. The adjacent graves are pits sunk in the surface of the flow. Some are lined and covered with flat stones from the beach." [Hudson 1932: 434] Hudson also notes a "former burial cave, a short distance south of site 179 [Makaoiki]. The cave is known as "Kalua Makini". [Hudson 1932: 436] In this same vicinity, Hudson reported a trail of smooth water-worn beach boulders.

In the land of Pulama (on old maps the ahupuaa bordering Kahauale'a to the west) Hudson reports a heiau, Makaiwa, three miles from the sea. What all but assured Hudson that this structure was a heiau was the fact that an informant of Hudson's in 1932, Mr. George Kekauula, "says that in his youth this site was larger and well preserved. He and his brother took many of the stones from the heiau to build walls." [Hudson 1932: 456,7] Thrum calls it an "ipuolono" or agricultural-type heiau. Early Hawaiian scholar S. M. Kamakau says such " ipuolono heiaus... temples, or more properly household shrines, were to foster food. Whenever the land was suffering from famine on account of dry weather...then those who knew how to recuperate the land would build a house to the god pertaining to rain, and the land would be sure to revive." [Hudson 1932: 457]

Mention of this heiau, though it is not in Kahauale'a, is made here for two reasons.

First: The location of Makaiwa heiau three miles inland, coupled with the location of several other heiaus in the southwest Puna area that Hudson places nearly as far inland, strongly suggest that there was significant activity in Kahauale'a and nearby ahupuaa well inland of what was expected when the present study was initiated.

Second: At three miles from shore, Makaiwa heiau and attendant sites are almost to the furthest inland reaches of Pulama which is bounded by a dog-leg of Kahauale'a to the north. In fact, Makaiwa heiau and the other sites are located just a few hundred yards outside Kahauale'a [see attached map]. Hudson notes that in support of the classification of Makaiwa as an "ipuolono" heiau are "the many old agricultural workings found nearby [that] indicate that the purpose of the heiau was to protect and fructify the crops" [Hudson 1932: 457]. He goes on to say "In the neighborhood of Makaiwa heiau are a number of platforms, house sites, terraces, pens, and walls. Many of these are now so far destroyed that it is impossible to describe them with any accuracy; others have probably escaped attention because of the heavy undergrowth which now covers the surrounding country. A sufficient number of recognizable sites, however, can still be found to indicate that this section of Pulama was well developed." [Hudson 1932: 458]

It should be noted here that while much of Kahauale'a is still in native forms of vegetation, the introduction of exotic species and, secondarily, recent lava flows have significantly altered the present vegetative profile from that of pre- and early post-contact Kahauale'a.

To extrapolate that there might be sites or site complexes a few hundred yards away in Kahauale'a, at the same distance or more inland, is not unreasonable. In the attached xerox of Hudson's rough site location map one can see more clearly the extent and location of the inland sites that he reported.

UPLAND SITES

It is, in fact, at the elevation of Makaiwa heiau and accompanying sites that Jim Jacobi [personal communication 1982] reported during a bird survey done in the late 1970's, seeing a number of sites. His recall is that these sites were about 1½ to 2 miles below Kalalua Crater situating them in Kahauale'a at about 1200'-1500' elevation, 3½ to 4 miles inland, and by crude calculation relatively near the Makaiwa heiau complex.

Moving up in elevation Mr. Jacobi also recalled seeing a scattering of apparent sites immediately mauka of Kalalua Crater. He also reported part of the ancient trail that Wilkes' party used as still being in evidence in this Kalalua vicinity. Lastly, he recalls seeing certain cultigens, particularly the ti plant, growing in the Kalalua area, further suggesting one time agricultural activity.

The extent of inland agricultural activity in western Puna can be gleaned from an overview by Handy.

> Taro was still, in 1935, grown on homesteads in...upper Kaimu, Makena, and Kalapana, as far as the forested slopes behind the village of Kapa'ahu. One energetic Hawaiian of Kapa'ahu had cleared 'ohi'a forest, at a place called Kaho'onoho about 2.5 miles inland, and had a good stand of taro, bananas, and sugar cane in two adjacent clearings. According to this planter, there used to be some planting in the forest southwest of Kapa'ahu, but the coast is too dry. However, the whole forest land northeast of Kapa'ahu with the exception of a section destroyed by lava flows, is capable of supporting taro and used to be covered with plantations.
>
> According to information received in that locality, Kaho'onoho and Wala'ohia were the two great forest planting areas in Kahauale'a ahupua'a. Kupahua, now a homesteading area, formerly supported taro, as did upper Kalapana and upper Kaimu. [Handy & Handy 1972: 541]

Handy recorded this information in 1935 when there were still individuals living who were familiar with Puna's early history. If his informants are to be believed (and there is no reason they shouldn't be), there is very strong evidence for agricultural activities well inland in Kahauale'a. On an attached map one can see that the "land northeast of Kapa'ahu [that]...used to be covered with plantations" is adjacent and virtually identical in terms of terrain and vegetative cover to the lower mauka portions of Kahauale'a. The description of Kaho'onoho at least 2.5 miles into Kahauale'a's forested interior, and Wala'ohia, also considerably inland, as "the two great forest planting areas in Kahauale'a" rather pointedly suggests upland agricultural activity in Kahauale'a. Similarly, the Kupahua homesteading area, upper Kalapana and upper Kaimu are all three to four miles inland, quite close to Kahauale'a, and similar in nature of terrain and vegetation. Supporting Handy's observations on agricultural activity in western Puna are other references, some already noted and more below. Perhaps the earliest is that of Rev. William Ellis traveling through Puna in 1823. While staying at the fishing village of Kealakomo (down a little ways towards South Point from Kahauale'a) Ellis remarks that "the head man of the village...came into our house after it [the service] was over, and told us all his provisions were at his farm, at a considerable distance inland." (Ellis 1825: 153]

Two other references, if calculations and assumptions are correct, would place agricultural activities well into Kahauale'a's interior. In 1841, Capt. Charles Wilkes, head of the U.S. Exploring Expedition, after extensively exploring the Kilauea area of the Volcano, set off on an ancient trail down the Puna rift zone. His party departed early in the morning from Panau which he says "is two thousand six-hundred and seventy-six feet above the sea, and was found by observations to be ten miles southeast of Kilauea.... We left Panau after half-past eight o'clock, and passed on towards the east. After traveling about three miles, we came in sight of the ocean, five miles off. Our course now changed to the northeast, and before noon we reached an extensive upland taro-patch..." [Wilkes 1845: 181] Allowing for a generous margin of error while pacing, backtracking and relating to other features or locations Wilkes mentions, puts the "extensive upland taro patch" fairly comfortably in Kahauale'a, probably at between 2000' and 2200' elevation.

Chester Lyman, who traveled through Puna in 1846 with Rev. Coan, also reports agricultural activity in what seems to be the interior of Kahauale'a. He writes:

> Our route from Kahauale'a [village] lay northerly, gradually rising. By half past 2 p.m. we had reached a plantation in an unsettled region where a good old man had been at work all day putting up a small neat house of ti leaves, in expectation that we would stop here for the night. Plantains, pawpaws, taro, etc. were growing around...we went on about 5 miles further, or 10 miles from Kahauale'a [village] over an exceedingly rough and jagged path and through a dense miry thicket to a small grass shanty... [Lyman 1846: 19]

By Lyman's calculations this plantation is 5 miles inland from the sea, putting it not far from Kalalua and possibly not far from Wilkes' taro patch. At 10 miles he makes note of "a small grass shanty" that could have been a temporary abode for travelers, farmers, or forest product gatherers.

At Panau, a small village mentioned earlier, located apparently just below Napau crater, there was also agricultural activity. Rev. William Ellis, traveling in 1823 through what appears to be the Panau area, says "The natives ran to a spot in the neighborhood, that had formerly been a plantation, and brought a number of pieces of sugar-cane..." [Ellis 1825: 149]. Archaeologist Stell Newman refers to the plantation Ellis references as a "field system" located

about 5 miles inland somewhere in the upper Panau district. While Panau village is not in Kahauale'a, it was apparently located quite near to the northwestern border of Kahauale'a. (Kahauale'a and Panau ahupuaa are contiguous in their northern boundaries.) That there was a permanent village this far inland (about 5 miles) and within minutes of walking time from Kahauale'a, would lead one to suspect that permanent and temporary inhabitants of Panau made regular trips into Kahauale'a for various forest products.

Surgeon Charles Pickering, traveling with Wilkes' party in 1841, notes that "we stopped for the night at the chief's house halfway up the slope [between the shore and Kilauea--in other words 5-8 miles inland]. A monument had been erected 'to the memory of the sister of the chief's wife,' with thick stone walls and having the form of an ordinary Hawaiian house. Old times were back again in this portion of the island" [Pickering 1848: 96]. Such a reference indicates, once again, habitation and traditional type activity (burial) well inland and close to Kahauale'a.

Wilkes, in 1841, says of Panau that "Here many canoes are built and transported to the sea, the trees in the vicinity being large and well adapted to this purpose. I was told they met with a ready sale." [Wilkes 1845: 181] Similarly, Surgeon Charles Pickering, who was part of Wilkes' party, reports while somewhere in the pit crater area below Kilauea of falling "in with a party of about twenty natives, on their way to the woods beyond Kilauea, to drag a canoe down the coast." [Pickering 1848: 97] What these canoe related references suggest is that logging koa trees for canoe hulls and procuring wood for other canoe parts might well have been another inland forest activity within Kahauale'a.

It should also be noted that Keanakakoi Crater (lit. the adze-making cave) an important adze quarry for the districts of Puna, Kau, and Hilo, was located within a mile of the northern terminus of Kahauale'a. Though buried by lava in 1877, it can be assumed that prior to this time it saw regular use in that adze quarries were few and among the most valuable of resources to the ancient Hawaiian. That there would have been some spillover activity by members of the adze-makers guild and or his helpers into nearby Kahauale'a for purposes of food and forest product gathering is not at all unlikely.

Hudson, while not mentioning Panau by name, says that "a few sites were also found in the upland forest region around Makaopuhi and Napau craters at an elevation of about 2,700 feet 6 miles from the sea" [Hudson 1932: 486]. Unfortunately, he does not elaborate further on just where the sites were located or what type they were. He does, though,

go on to describe other suspected and known sites in the Panau village vicinity. He notes that:

> "West of the pulu factory on the right of the trail is a rectangular walled enclosure 30 feet square. Outside the walls near the corners are four cairns about 4 feet high built of fragments of lava. Mr. Brumaghin [an informant of Hudson's] thinks they are akua. He says the region was formerly used as a prison camp and that the inclosure was probably a heiau built by the prisoners. About 100 yards beyond the preceding site [the supposed heiau] is a rough walled inclosure which was probably a pen for animals. In an ohia grove north of the Volcano-Kalapana trail at the bench mark 2730 feet are six or eight platforms and low pens. The platforms are built of earth and two of them may be natural. The ground has been leveled off and in some places filled and banked to make a flat surface. Mr. Brumaghin thinks the place was either a village site for pulu workers or a rendezvous for robbers. Similar platforms much overgrown are reported to be in the forest between this spot and Napau crater." [Hudson 1932: 516, 17]

These sites would all be very close to the northwestern border of Kahauale'a. Ellis mentions in 1823 a heiau near Kilauea-iki which is all but contiguous with the northernmost terminus of Kahauale'a. He writes: "They...pointed out to us the ruins of Oararauo [Oalalauo], an old heiau, which crowned the summit of a lofty precipice on our left. It was formerly a temple of Pele, of which Kamakaakeakua, (the eye of the god) a distinguished soothsayer, who died in the reign of Tamehameha [Kamehameha], was for many years priest. Large offerings were frequently made, of hogs, dogs, fish, and fruits, but we could not learn that human victims were ever immolated on its altars." [Ellis 1825: 145]. Hudson reports that Brumaghin and Brigham feel though that this heiau was located on the west side of Kilauea crater, between Halemaumau and Uwekahuna observatory.

Whatever the exact location of this heiau and other inland sites the point is firmly made. There was a variety of activities, such as canoe building, agriculture, and bird-catching, in the greater volcano area and regular travel through it along several trails. Kahauale'a mauka was an integral part of the physical and resource bounds of these early inhabitants, temporary workers, and transients. In summary, it would not be unreasonable to expect that there are archaeological sites in the mauka portions of Kahauale'a.

Informants:

Jason Achiu, archivist and Hawaiian language translator, Hawaii State Archives.
John Hauanio, lifelong resident of Kalapana area; previous employee, Hawaiia Volcanoes National Park.
Jim Jacobi, biologist, U.S. Fish and Wildlife Service.
Larry Katehira, employee, Hawaii Volcanoes National Park.
Ed Ladd, archaeologist, Hawaii Volcanoes National Park.
Kaipo Roberts, lifelong resident of Kahauale'a; owns kuleana on ocean at Kahauale'a.
Bruce Shimizu, employee YACC; pig hunter, volcano area.
Shigeru Shimizu, employee at C. Brewer; longtime pig hunter in volcano area.

Sources:

Hawaii State Archives
State Survey Office
University of Hawaii - Hawaiian & Pacific Collection, Hamilton Library
Bishop Museum
Mission Houses Museum
Campbell Estate Kahauale'a Files

BIBLIOGRAPHY

1. Apple, Russel A. 1965. Trails. Bishop Museum Press, Honolulu.
2. Hawaii State Archives, 1893 Boundary Petition Kahauale'a, Puna
   _____, Letter from Campbell to Lyman 1893.
3. Barrera, W. M.; Barrere, D. B. 1971. Archaeological and Historical Survey: Ahupuaa of Kupahua, Puna District, Island of Hawaii. Bishop Museum, Honolulu.
4. Bevacqua, R. F.; Dye, T. S. 1972. Archaeological Reconnaissance of Proposed Kapoho-Kalapana Highway, District of Puna, Island of Hawaii. Bishop Museum, Honolulu.
5. Brigham, W. T. 1909. The Volcanoes of Kilauea and Mauna Loa on the Island of Hawaii. Bishop Museum, Honolulu.
6. Bryan, E. H. 1975. Study done for Campbell Estate.
7. Campbell Estate. Kahauale'a File - deeds, documents, communications, maps, etc.
8. Coan, Rev. Titus. 1882. Life in Hawaii. Randolph and Co., New York.
9. Dept. of the Interior, U.S. Geological Survey 1912 & 1922, County of Hawaii. Glenwood Quad; Puna Quad; Puna Forest Quad; Wahaula Heiau Quad.
10. Dutton, Capt. C. E. 1884. Hawaiian Volcanoes. U.S. Geological Survey, 4th Annual Report.
11. Ellis, William. 1825. Journal of a Tour Around Hawaii. Crocker & Brewster, Boston.

12. Emerson, N. B. 1895. The Bird-Hunters of Ancient Hawaii. Hawaiian Almanac & Annual, Honolulu.
13. Fornander, Abraham. 1916-1920. Collection of Hawaiian Antiquities and Folk-lore Bishop Museum, Honolulu.
14. Handy, E.S.C. and E.G. Handy. 1972. Native Planters in Old Hawaii Bishop Museum, Honolulu.
15. Holmes, Tommy. 1981. The Hawaiian Canoe Hanalei, Kauai.
16. Hudson, A. E. 1932. The Archaeology of Eastern Hawaii, Volumes II & III Typescript, Honolulu.
17. Kane, G. K. 1929. "Huakai Maikai..." Hoku o Hawaii. Bishop Museum, Honolulu.
18. Kennedy, Joseph. 1982. An Archaeological Literature Search for the Ahupuaa of Kahauale'a, typescript, Honolulu.
19. Lydgate, J. 1875. Survey of Kahauale'a.
20. Macdonald, G. A. and Abbott, A. T. 1970. Volcanoes in the Sea. University Press of Hawaii, Honolulu.
21. Manning, Anita. 1981. Hawelu: Birdcatcher, Innkeeper, Farmer, The Hawn. Jour. of Hist., Honolulu.
22. Newman, T. S. 1970. Hawaiian Fishing and Farming on the Island of Hawaii in A.D. 1778. DLNR, Honolulu.
23. Nordhoff, Charles. 1879. Northern California, Oregon and the Sandwich Islands, Harper, New York.
24. Pickering, Charles, M. D. 1848. "U.S. Exploring Expedition..." Volume IX, The Races of Man. Philadelphia.
25. Pukui, M. et al. 1974. Place Names of Hawaii. University Press of Hawaii, Honolulu.
26. Siegel, S. M. 1981. Final Rpt. Environmental Survey of the Campbell Estate Geothermal Prospect of Kahauale'a, Honolulu.
27. Stearns, H. T. 1946. Geology and Groundwater Resources of the Island of Hawaii, Honolulu.
28. Thrum, T. G. 1910. Canoeing off the Puna Coast of Hawaii, The Hawaiian Annual, Honolulu.
29. Thrum, T. G. 1908. Heiaus and Heiau Sites Throughout the Hawaiian Islands, Hawaiian Almanac & Annual, Honolulu.
30. Whitney, H. M. 1890. The Tourists Guide Through the Hawaiian Islands, Honolulu.
31. Wilkes, Charles. 1845. Narrative of the U.S. Exploring Expedition During the Years 1838-1842, Volume IV, Philadelphia.

Date: April 14, 1982

220-1g

CURRICULUM VITAE
Tommy Holmes

Home Address:	813 21st Avenue Honolulu, Hawaii 96816 808 (732-6356)
Office:	Science Management, Inc. 830 Ala Moana, Suite 220 Honolulu, Hawaii 96813 808 (533-1751)
Present Position:	Program Coordinator, Science Management, Inc.
Academic History:	B.A., Southeast-Asian Language & Area Studies M.P.H., Reproductive Physiology & Anatomy/Population Studies Languages - Proficient in Hindi, Cambodian, French
Work History:	USPHS - Maternal & Child Health Survey in Micronesia (1970) Planner/Consultant (1971-1973) Legislative Analyst (1973-1976) Researcher/Writer/Consultant (1971-present) Consultant to - Inter-Island Resorts, Atlas Hotels, Sealife Park, National Geographic, ABC, NBC, BBC, VOA, Mauna Lani Resort, Campbell Estate, Service dela Peche (Tahiti), Amfac, Hawaii Bound, State of Hawaii, etc.
Miscellaneous:	Co-founder, Polynesian Voyaging Society - crewmember/ researcher/writer President 1980-1982, Hawaii Planned Parenthood President, Aloha Tower Maritime Center Board Member, Habilitat Author/consultant/scholar/lecturer Hawaiiana/Pacificana Recently published The Hawaiian Canoe

9/27/82

EXHIBIT "A"